

AIM (Asia-Pacific Integrated Assessment) project team
National Institute for Environmental Studies (NIES), Japan

Screening barriers and actions for policies based on modeling result

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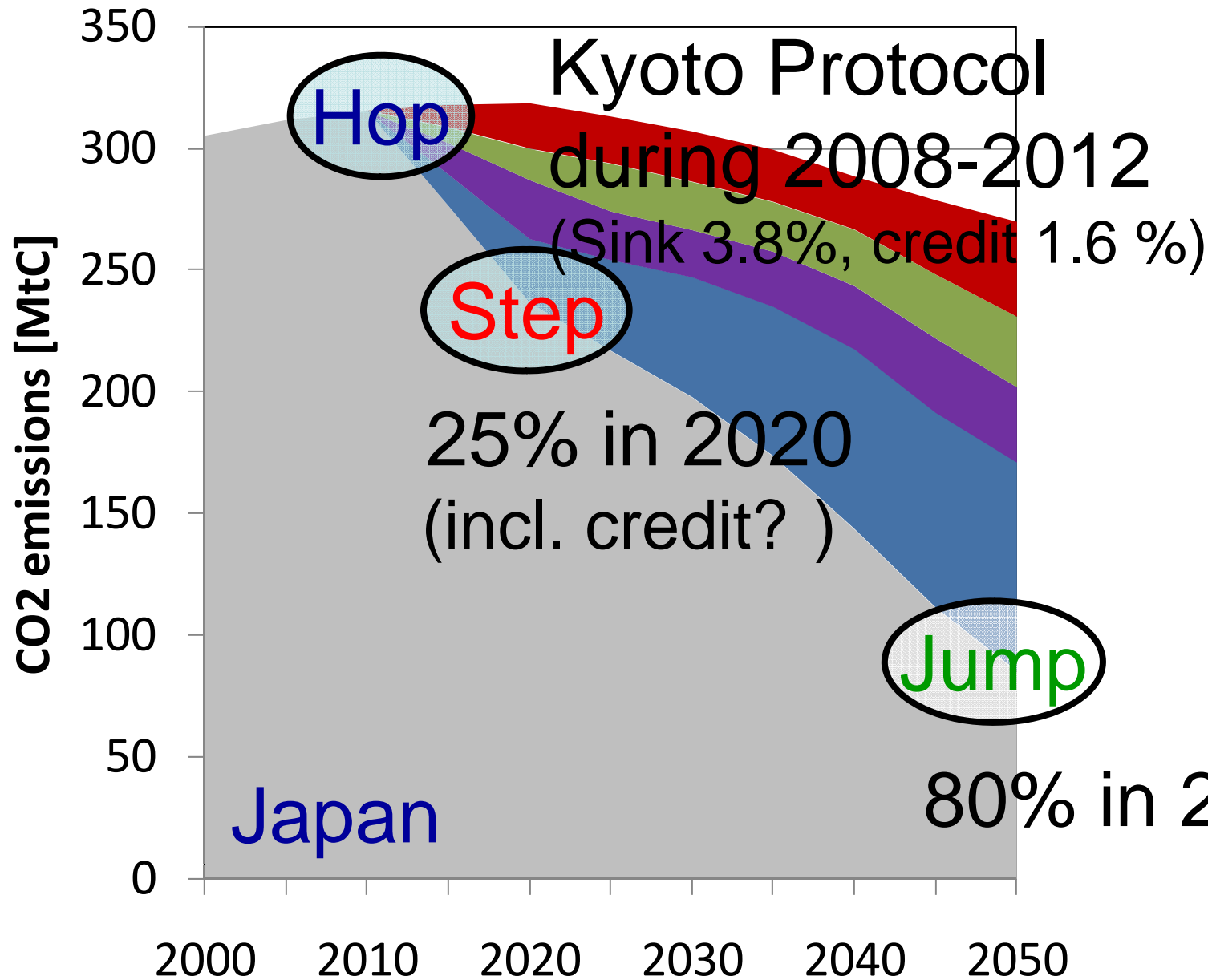
Member of “25%” taskforce
Member of MOEJ mid- and long-term roadmap WG
Member of Japan and Asia LCS research project
Member of IPCC renewable energy special report



Dialogue between policy makers and researchers:

Demands and roles of SLCD/GG researchers from policy perspective, 16 Feb, 2010, Bogor, Indonesia

Japanese Emissions Targets towards 2050



New Prime Minister
Hatoyama
鳩山由紀夫

Japan

Even we understand the necessity of low-carbon society...

- Difficult to have global agreement: COP15
- Difficult to change and find easy solutions
- Huge cost? Huge economic impact
(lower income, higher unemployment rate, lower GDP growth rate)?



日本政府中期目標達成分析タスクフォース

1. モデル分析を行う研究機関

国立環境研究所(増井利彦 社会環境システム研究領域統合評価研究室 室長
他(藤野純一、肱岡靖明、花岡達也))

- AIM/Enduse[Global]モデル(世界モデル)
- AIM/Enduse[Japan]モデル(日本モデル)
- AIM/CGE[Japan]モデル(経済モデル)

5 research teams

地球環境産業技術研究機構(秋元圭吾 システム研究グループ グループリーダー 他)

- RITEモデル(DNE21+) (世界モデル)

日本エネルギー経済研究所(伊藤浩吉 常務理事 他)

- エネ研モデル(日本モデル)

日本経済研究センター(猿山純夫 研究統括部 担当部長 他)

- 日経センター・一般均衡モデル(経済モデル)
- 日経センター・マクロモデル(経済モデル)

慶應義塾大学産業研究所(野村浩二 商学部教授)

- KEOモデル(経済モデル)

2. モデル分析を評価する有識者

有村 俊秀 上智大学経済学部経済学科准教授

飯田 哲也 環境エネルギー政策研究所所長

◎植田 和弘 京都大学大学院経済学研究科教授

栗山 浩一 京都大学農学研究科生物資源経済学専攻教授

土居 丈朗 慶應義塾大学経済学部教授

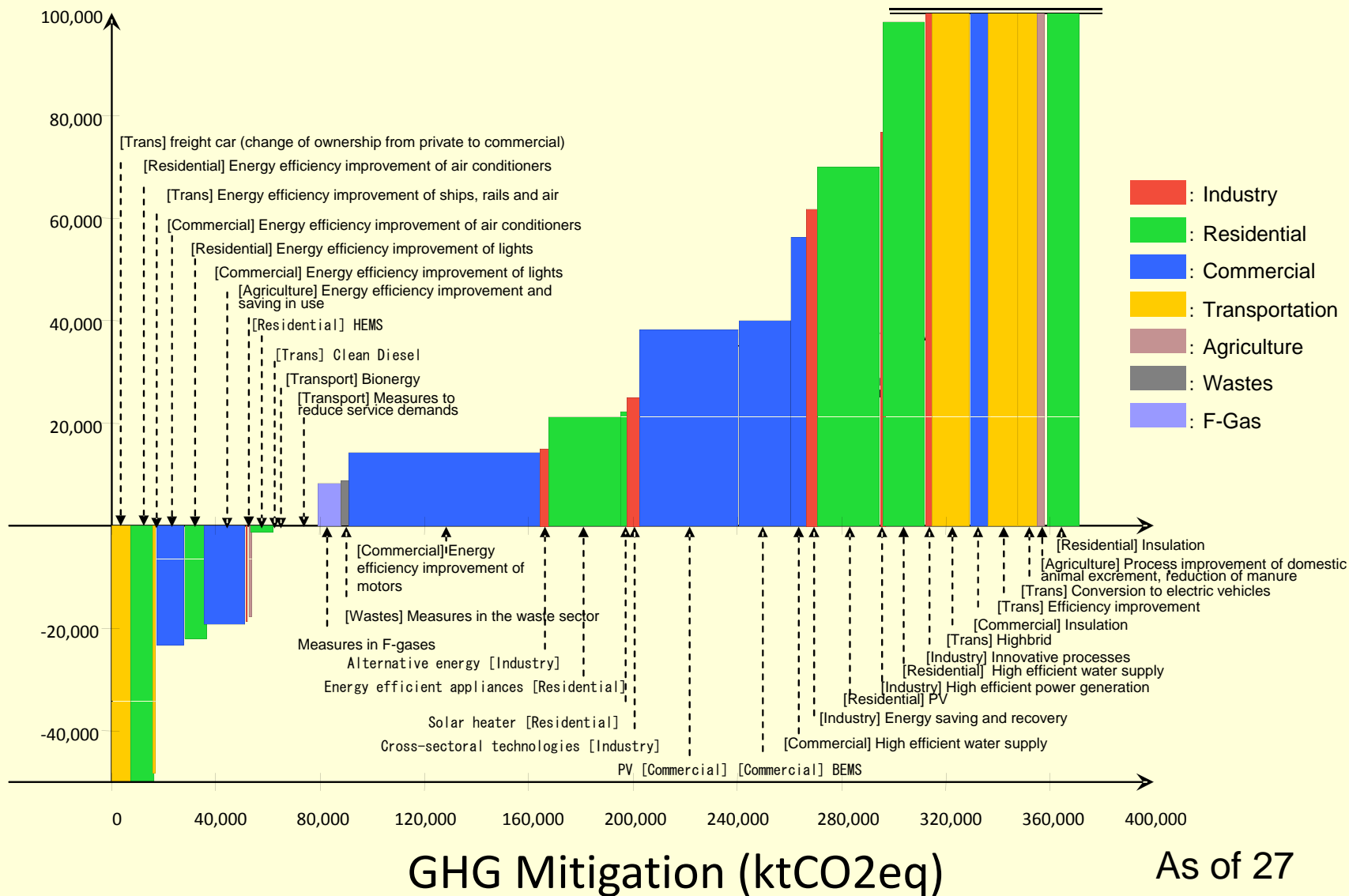
屋井 鉄雄 東京工業大学大学院総合理工学研究科教授

山口 光恒 東京大学先端科学技術研究センター特任教授

7 experts

Marginal Abatement Cost to Reduce GHG emissions

Mitigation costs (Yen/ktCO2)

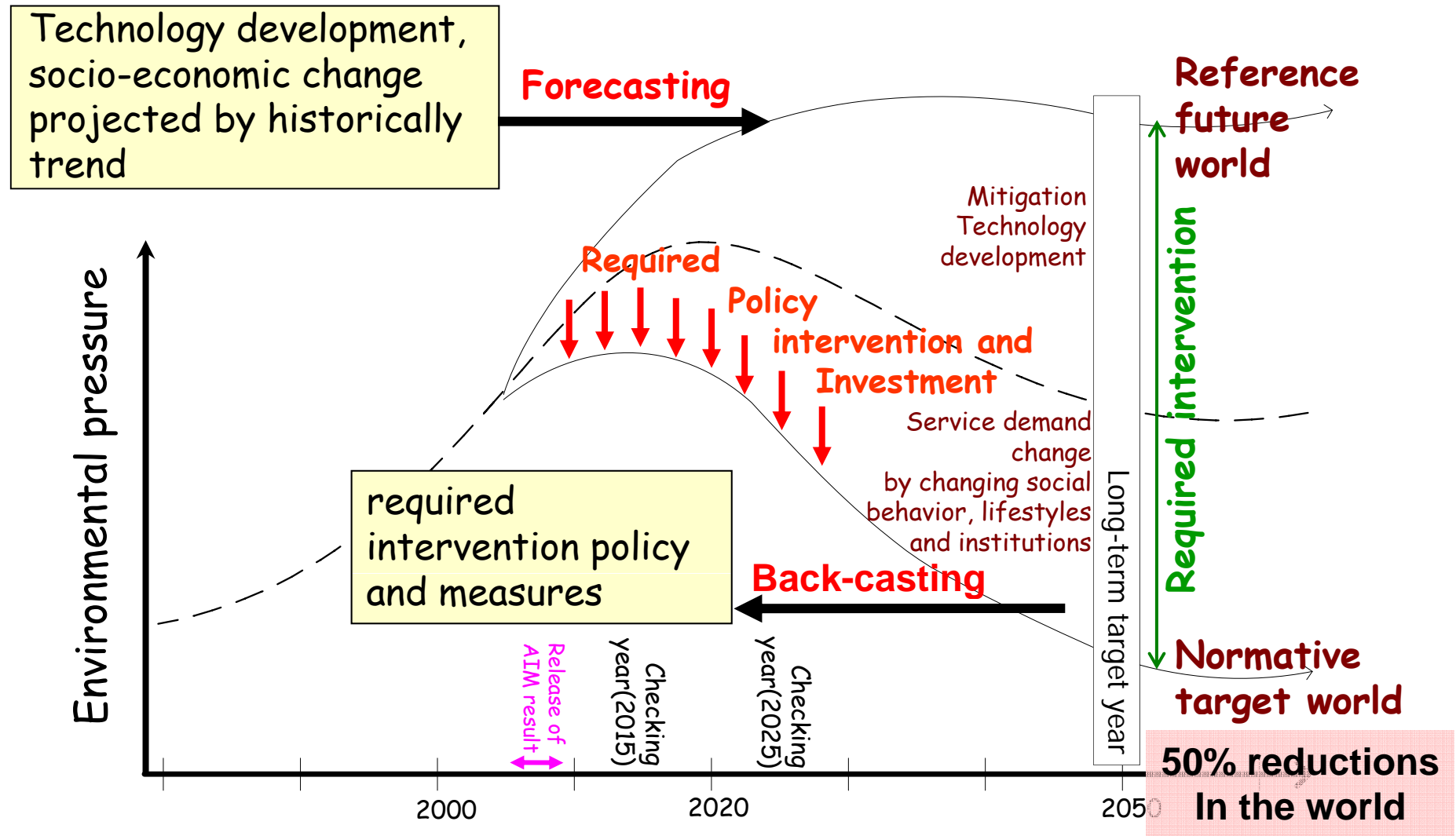


Japan

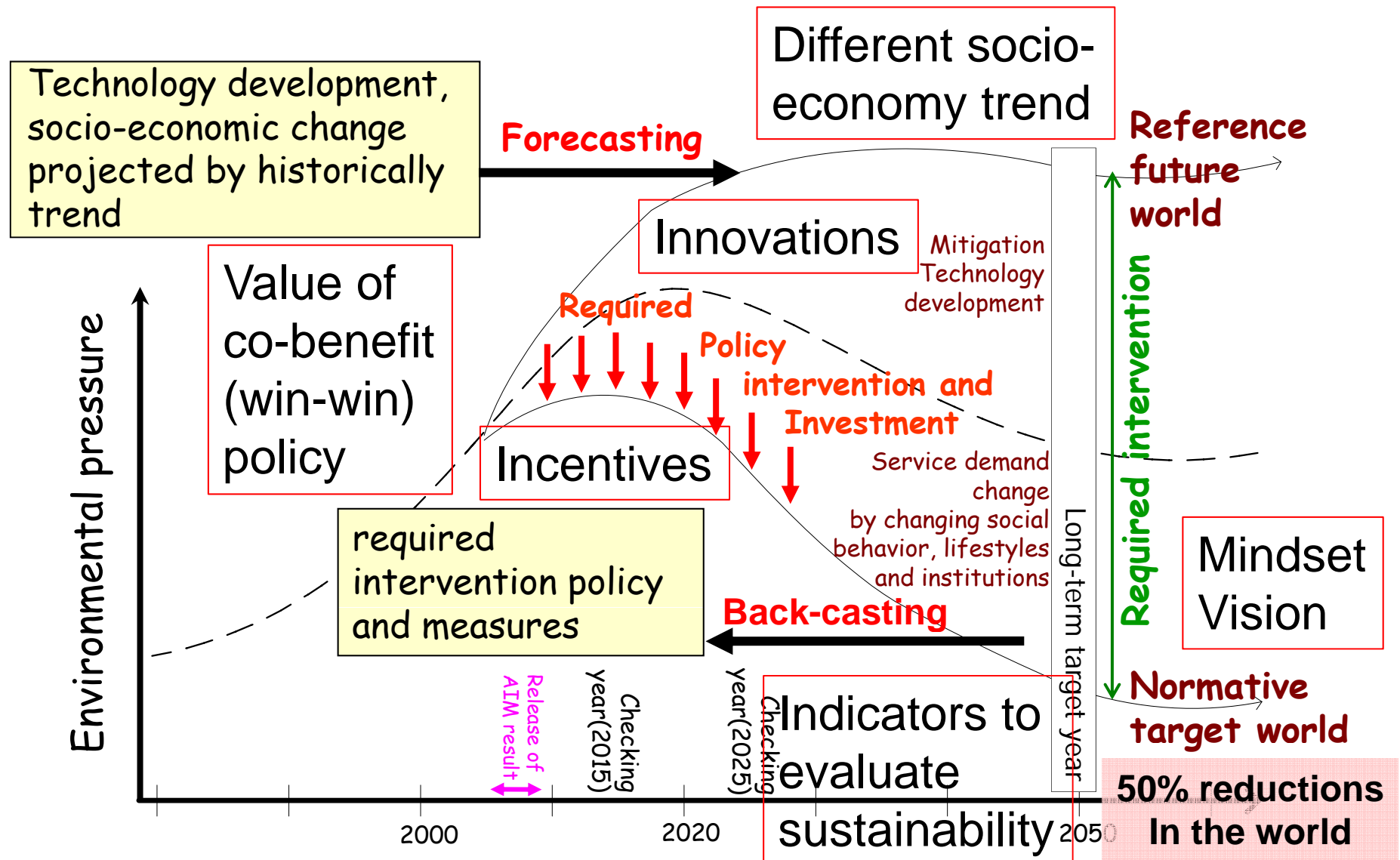
in 2020 (Case III)

As of 27
March
2009


Forecasting and Back-casting



Model can supply consistent scenario based on quantitative data/assumption



Japan LCS scenarios study



Y.Matsuoka
Kyoto.Univ
Scenario team

S.Nishioka
NIES, Project
Leader

J.Fujino
NIES
Coordinator

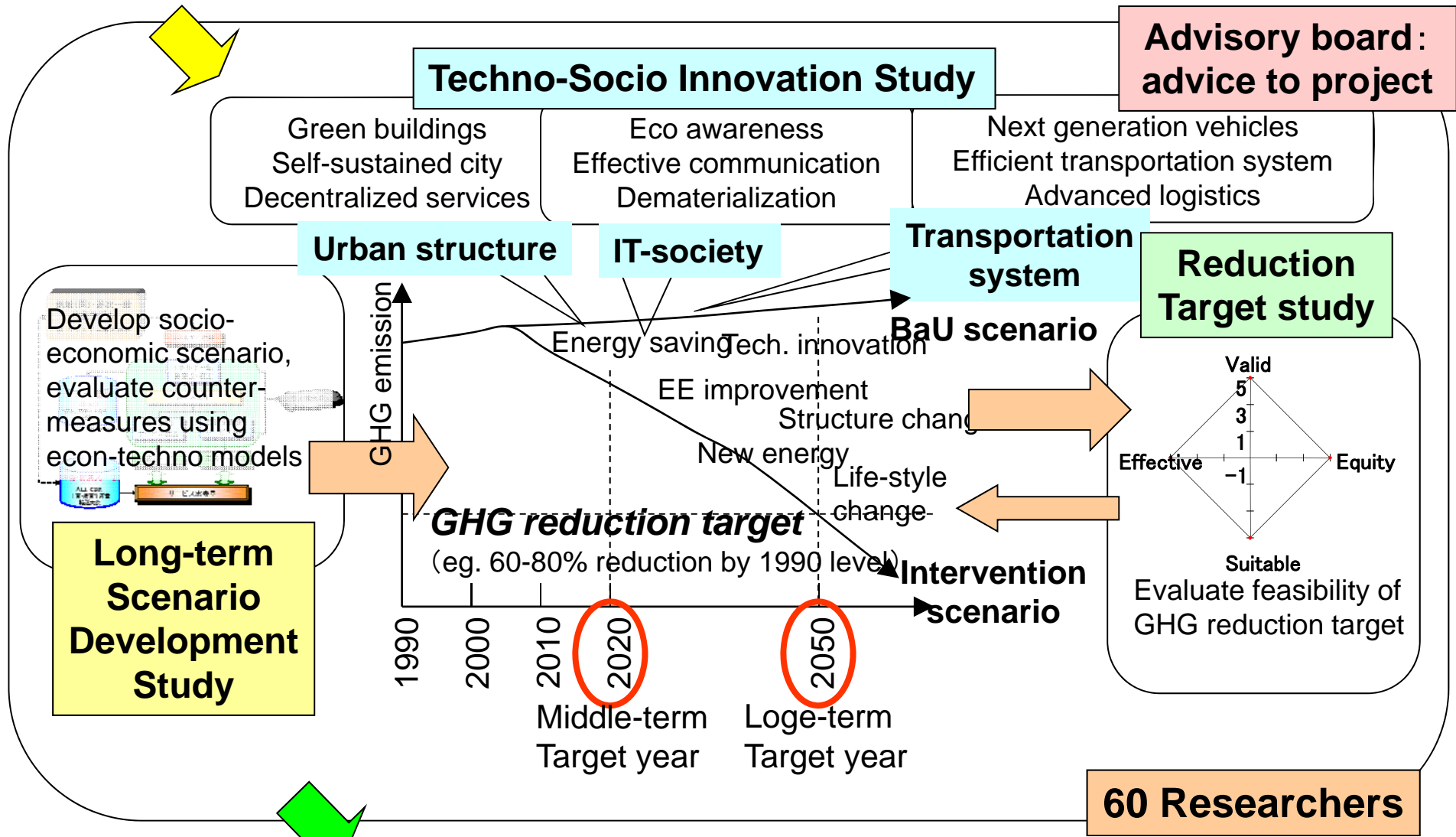
M.Kainuma
NIES,
Scenario
Team
leader

NIES has coordinated this Japan LCS research project during FY2004-2008 in collaboration with around 60 researchers from Tokyo Univ, Kyoto Univ, TIT, TSU, Forest Research Institute, etc.

Japan Low Carbon Society Scenarios toward 2050



Study environmental options toward low carbon society in Japan



Propose the direction of long-term global warming policy

Visions and Innovations

LCS house in 2050
Comfortable and energy-saving house

Utilizing solar power

Photovoltaic

34-69MW
(25-47% house has PV on roof (now 1%))
and develop high efficiency (<30%) PV

Eco-life education

10-20% energy demand reduction

Solar heating

Diffusion rate: 20-60%
(currently 8%)

Monitoring system equipped with appliances

Super high efficiency air conditioner

COP (coefficients of performance)=8,
share 100%

Stand-by energy reduction

Reduce 1/3 energy demand,
share 100%

Good information for economy and environment makes people's behavior low-carbon

rooftop gardening

High efficiency lighting
[eg LED lighting]

Reduce 1/2 energy demand
Share 100%

High-insulation

Reduce 60% warming energy demand,
share 100%

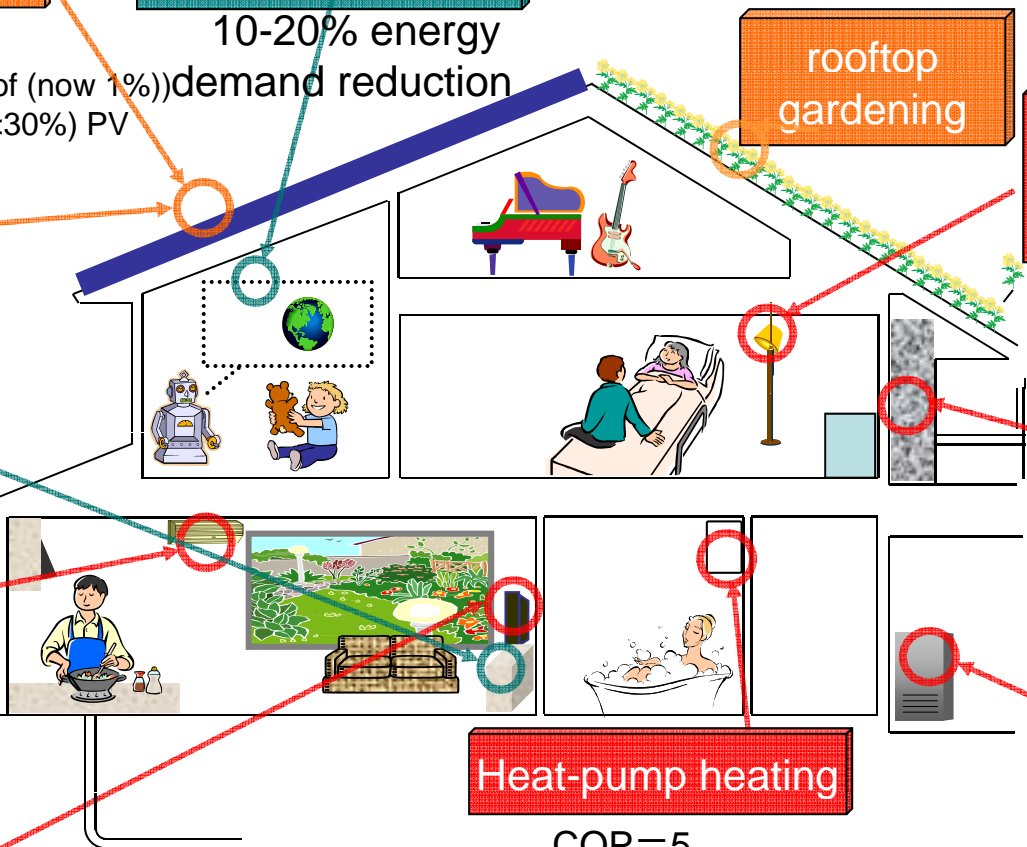
Fuel cell

share 0-20%

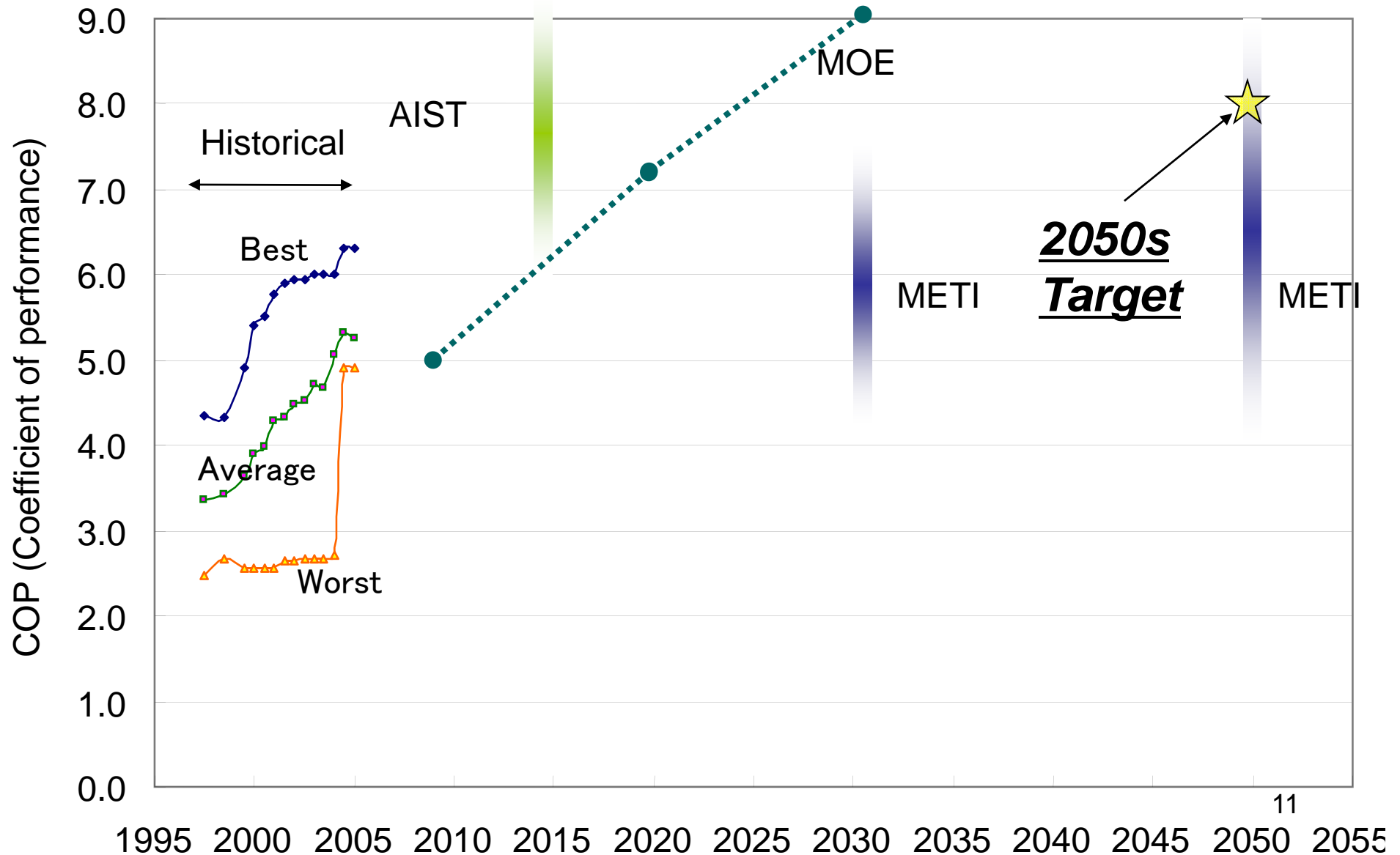
Heat-pump heating

COP=5
share 30-70%

High efficiency appliances reduce energy demand and support comfortable and safe lifestyle



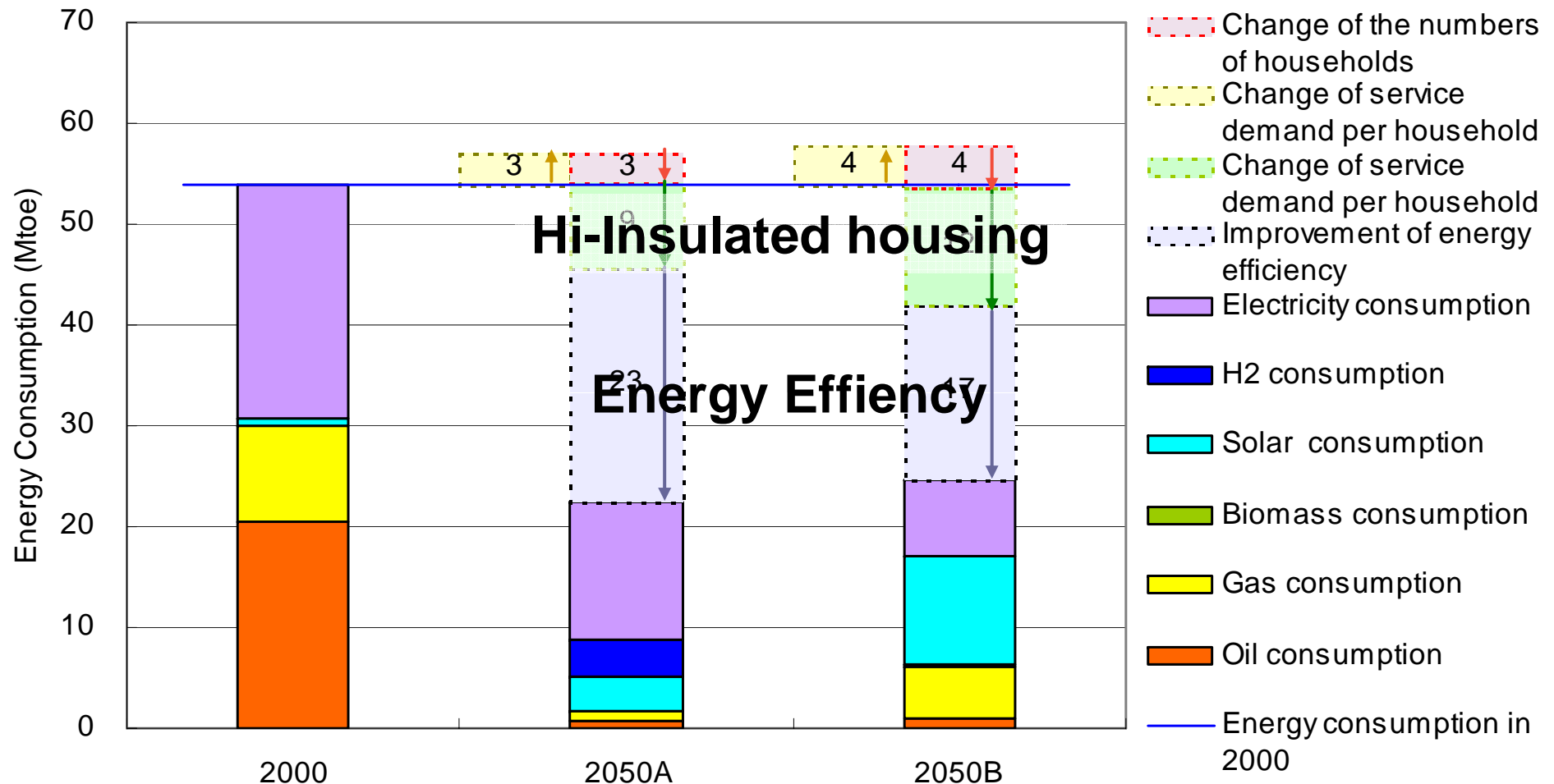
Projected energy efficiency improvement: Air-conditioners for cooling and heating



Residential sector

Innovations

Energy reduction potential: 40-50%



Change of the number of households: the number of households decrease both in scenario A and B

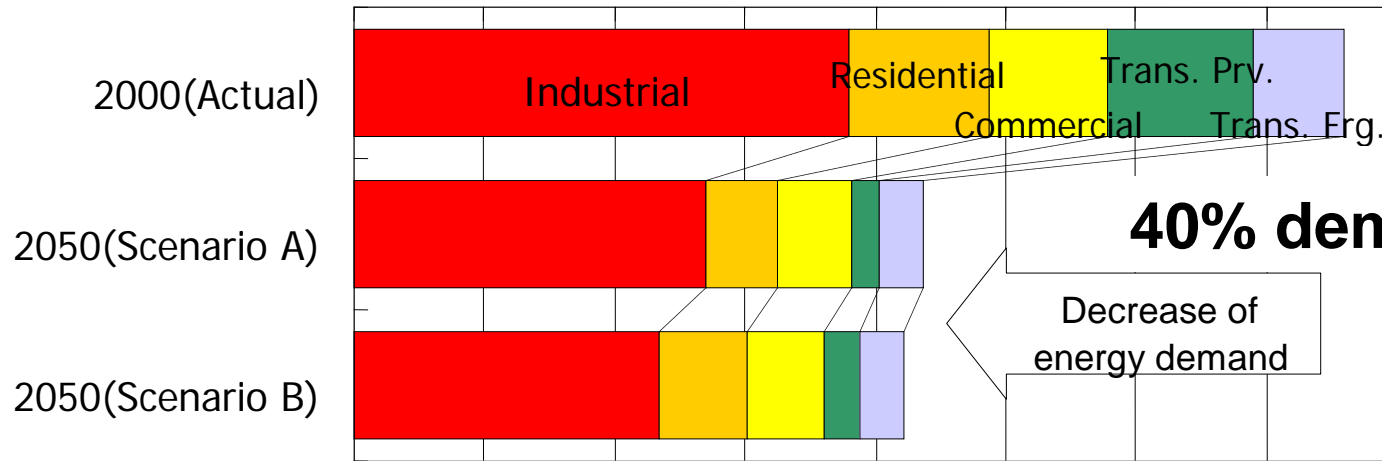
Change of service demand per household: convenient lifestyle increases service demand per household

Change of energy demand per household: high insulated dwellings, Home Energy Management System (HEMS)

Improvement of energy efficiency: air conditioner, water heater, cooking stove, lighting and standby power

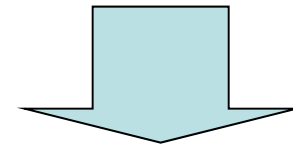
Secondary Energy Consumption (Mtoe)

50 100 150 200 250 300 350 400



40% demand reductions

Decrease of energy demand



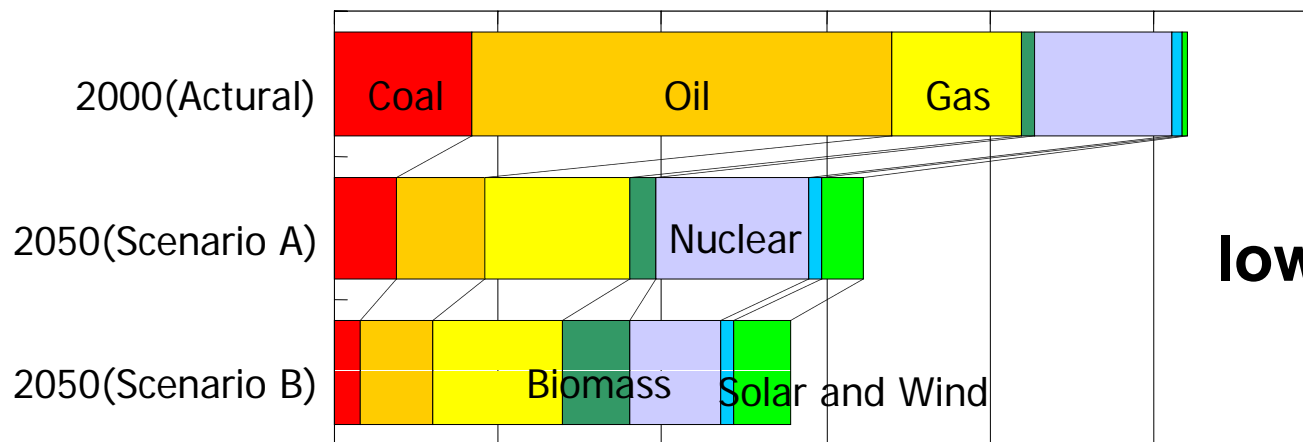
Industrial Residential Commercial Trans. Prv. Trans. Frg.

Trans. Prv.: Transportation (Private), Trans. Frg.: Transportation (Freight)

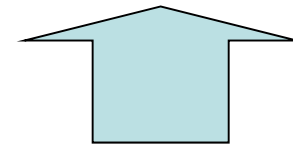
70% CO2 cut by 2050

Primary Energy Consumption (Mtoe)

100 200 300 400 500 600



low-carbon energy



Coal Oil Gas Biomass Nuclear Hydro Solar and Wind

How to implement
modeling results?

A Dozen Actions towards Low-Carbon Societies

Press release
on May 22, 2008

Residential/commercial sector actions

1. Comfortable and Green Built Environment

Efficiently use of sunlight and energy efficient built environment design. Intelligent buildings.

2. Anytime, Anywhere Appropriate Appliances

Use of Top-runner and Appropriate appliances. Initial cost reduction by rent and release system resulting in improved availability.

Industrial sector actions

3. Promoting Seasonal Local Food

Supply of seasonal and safe low-carbon local foods for local cuisine

4. Sustainable Building Materials Using local and renewable buildings materials and products.

5. Environmentally Enlightened Business and Industry Businesses aiming at creating and operating in low carbon market. Supplying low carbon and high value-added goods and services through energy efficient production systems.

Transportation sector actions

6. Swift and Smooth Logistics

Networking seamless logistics systems with supply chain management, using both transportation and ICT infrastructure

7. Pedestrian Friendly City Design

City design requiring short trips and pedestrian (and bicycle) friendly transport, augmented by efficient public transport

Energy supply sector actions

8. Low-Carbon Electricity Supplying low carbon electricity by large-scale renewables, nuclear power and CCS-equipped fossil (and biomass) fired plants

9. Local Renewable Resources for Local Demand

Enhancing local renewables use, such as solar, wind, biomass and others.

10. Next Generation Fuels Development of carbon free hydrogen- and/or biomass-based energy supply system with required infrastructure

Cross-sector actions

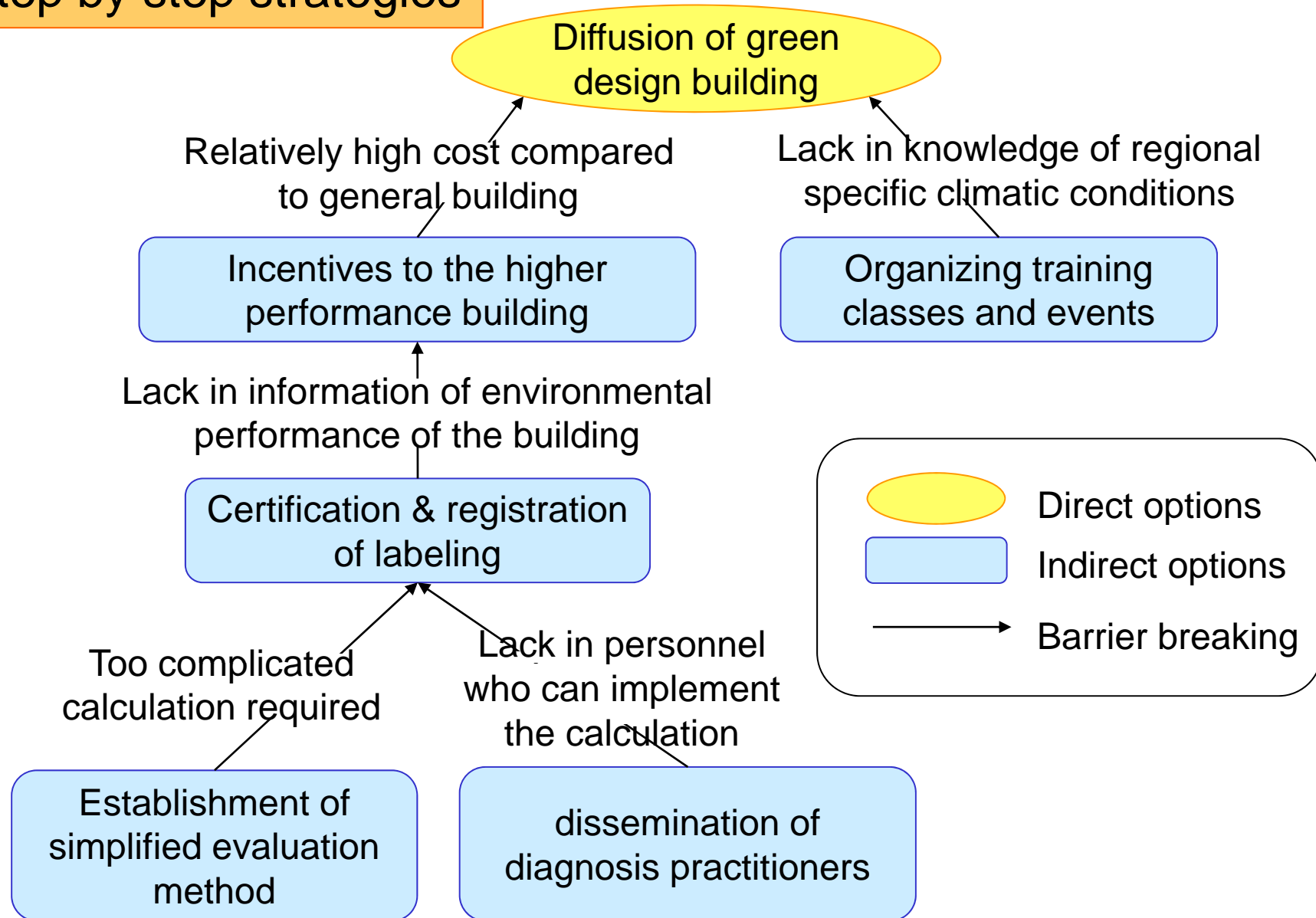
11. Labeling to Encourage Smart and Rational Choices

Visualizing of energy use and CO2 costs information for smart choices of low carbon goods and service by consumers, and public acknowledgement of such consumers

12. Low-Carbon Society Leadership Human resource development for building "Low-Carbon Society" and recognizing extraordinary contributions.

Identification of necessary actions

Step by step strategies



1. Comfortable and Green Built Environment

Contribution of Building Owners

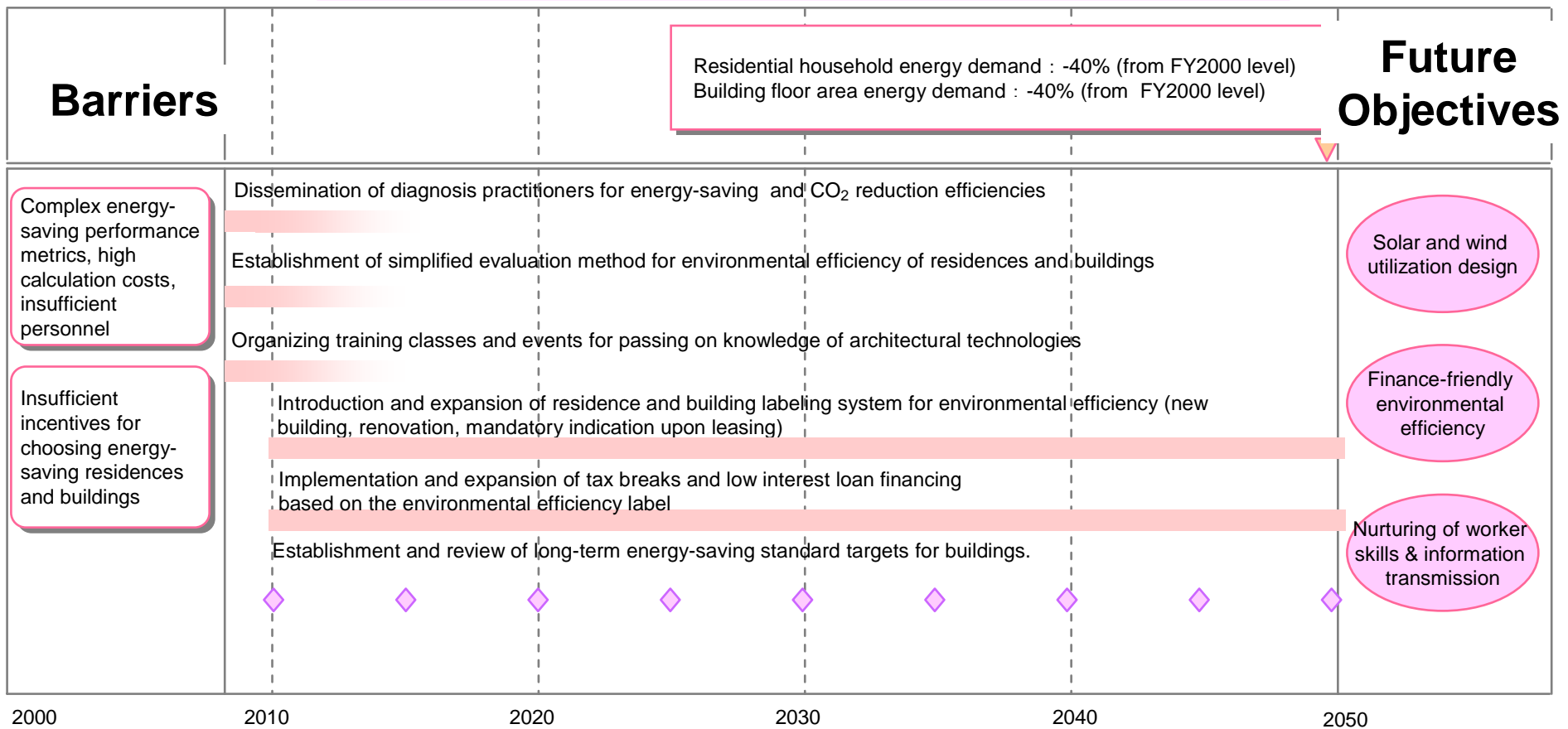
Selection of residential buildings with high environmental efficiency.
Commission of low carbon design to architects and construction companies.

Contribution of Architects, etc.

Development of low carbon architectural design methods. Investing for technology development in insulation technologies, etc. Sustenance of regional worker skills.

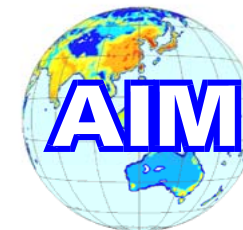
Standardization Period

Environmental Efficiency Labeling Introduction Period



Example to translate model results into policy actions

Japan LCS research project and CC policy



0. FY1990- start AIM (Asia-Pacific Integrated Model) project
 - FY1997 AIM provided Kyoto Protocol simulations for Japan
 - FY2000 AIM provided IPCC SRES/A1B marker scenario

1. Feb 13th 2007, Interim Report “Japan Scenarios towards Low-Carbon Society (LCS) -Feasibility study for 70% CO2 emission reduction by 2050 below 1990 level-”
 - May 24th 2007 Former Prime Minister Abe launched “Cool Earth 50” to reduce 50% GHG emissions by 2050
 - June 9th 2008 Former Prime Minister Fukuda set the target of Japanese CO2 emissions reduction by 60-80% in 2050

2. May 22nd 2008, Interim Report “Dozen Actions towards LCSs”
 - July 29th 2008 Japanese government set “Action Plan for Achieving a Low-carbon Society”

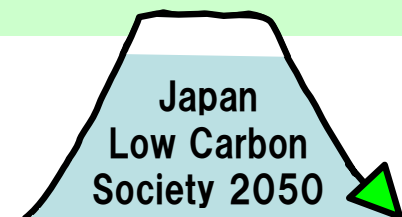
3. April 2009, The Mid-term Target Committee, “six options for 2020” (including 7%, 15%, 25% reduction compared as 1990 level)
 - September 22nd 2009, New Prime Minister Hatoyama set the year of 2020 target as 25%.

Do we really succeed to explain necessity of low-carbon society?

- Avoid energy resource battles by using resources in efficient ways
- Develop many innovations to support global sustainable development
- Build well-designed city for comfortable and friendly transportation, living, offices, amusement space in energy-saving/ renewable energy rich way...

Good entrance point to climb up the mountain “happy, challengeable and sustainable society”

**Model can support to develop
LCS scenarios in quantitative manner
with very good data input**





20091213-City Center, Copenhagen

Let's innovate good evidence!

Keyword: Normative, Learning, Ambiguity

